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Guide for Developing Integrated Solid Waste Management Plans at Army Installations

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Readiness thru Health

PREFACE

Regulatory directions and public opinion are placing increased emphasis on solid waste management and recycling issues. Industry, consumers, and government entities are being forced to evaluate their solid waste management practices and increase the extent of their source reduction, recycling/resource recovery programs, and procurement of products with recovered materials. In most states, the counties are required to develop integrated solid waste management plans (ISWMPs). County plans sometimes include data for Army installations, but do not provide a detailed assessment of solid waste management on the installations. Army regulations require each installation to develop an ISWMP. The process of developing the ISWMP requires thorough evaluation of all aspects of solid waste management, resulting in meaningful planning and goal setting.

"Integrated" solid waste management reflects the U.S. Environmental Protection Agency's pollution prevention hierarchy, which includes (in preferential order) source reduction, recycling, treatment, and disposal. To fully integrate the waste management system, purchasing of recycled content products, or Green Procurement, is needed to stimulate markets for recycled goods. Therefore, the ISWMP addresses each of these components. It identifies source reduction measures that may be used to reduce the waste stream. It defines the various elements of the waste stream and identifies the avenues of reuse, recycling or disposal for each. It closes the circle on recycling by incorporating Green Procurement into contracting and purchasing. It documents correct procedures for all aspects of solid waste management including storage, collection, segregation, transportation, treatment, recycling, and disposal. It presents factors potentially affecting solid waste management, and lists alternatives and contingency plans for future consideration. It assigns responsibilities and tasks to installation personnel for the effective execution of the solid waste programs. Lastly, it identifies actions that can be taken to improve solid waste management on the installation.

The decisions involved in solid waste management today are diverse and far-reaching. Should we contract disposal or operate an onsite landfill? Will recycling pay or cost us? Which recyclables should be included in the recycling program? Should we build an incinerator or utilize regional disposal facilities? How can we motivate personnel to implement source reduction practices? How can Green Procurement practices be used to minimize waste generation?

Although many installations are faced with such questions, it is beyond the scope of this guide to provide the necessary analysis and decision-making tools. Factors affecting solid waste decisions will vary with location, state legislation, recyclable markets, type of facility, population, and mission, to name a few. This technical guide is meant to provide Army installations with a generic framework for developing a complete and effective ISWMP. Decision-making, policy, and planning factors are provided for consideration where applicable.

Finally, the following objectives should be kept in mind when preparing the ISWMP:

- Complying with applicable Federal, state, local, and Army regulations regarding solid waste management and recycling.

- Achieving waste reduction goals set by the Army, the Department of Defense, and the state and Federal governments.

- Characterizing the types and amounts of solid waste (including non-regulated or special wastes, potential recyclables, and construction debris) generated through standardized data collection procedures.

- Describing the storage, collection, transportation, and disposal for each category of solid waste identified.

- Demonstrating that alternate disposal mechanisms have been identified and evaluated prior to the selection of the preferred disposal method.

- Evaluating future disposal options based on changes in waste generation, governing regulations, and/or the availability of regional disposal facilities.

- Assessing recycling and composting programs and identifying ways to improve the programs.

- Identifying Green Procurement practices that reduce waste and conserve resources.

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GUIDE FOR DEVELOPING INTEGRATED SOLID WASTE MANAGEMENT PLANS AT ARMY INSTALLATIONS

1. **GENERAL.**

a. Basis for Guide. This technical guide was developed to assist Army installations in meeting the requirements for developing a written Integrated Solid Waste Management Plan (ISWMP). The guide reflects current U.S. Environmental Protection Agency (USEPA) and Army regulations, guidelines, and philosophies. This guide covers the relevant issues pertaining to solid waste management and has the flexibility to be tailored to specific installation needs.

b. Guide Format. This guide is structured to mirror the organization of an ISWMP, beginning with the following section, APPLICABLE REGULATIONS AND REFERENCES. An outline format is presented to facilitate conversion to an actual plan. Each section provides suggested information that the writer should include. Also included are text boxes containing additional useful information. It may be appropriate to include similar explanatory text in the ISWMP to strengthen the plan as an educational and promotional tool.

2. **APPLICABLE REGULATIONS AND REFERENCES.** Applicable laws, regulations, and published guidance should be used in the development of the ISWMP and referenced within the document. A comprehensive list of state, Federal, and Army references on the subjects of solid waste management, recycling, and Green Procurement is provided below. The list is not exhaustive, so it may be appropriate to include other references. Also, be sure to include new regulations or guidance documents that have been published since the publication of this guide. Though Federal legislation has established national solid waste policy, states have the lead for policy implementation, the right to issue more restrictive regulations, and the power of enforcement. State and local requirements are often the most stringent and dominating factors driving an installation's solid waste management program. The generic state regulations are therefore prioritized below, and local rules should be added when applicable.

a. State Solid Waste Management Act. (Title, Chapter, date of enactment, summary of requirements.)

b. State Solid Waste Management Regulations. (Governing Agency, regulation title, latest date of amendment, summary of requirements.)

c. Resource Conservation and Recovery Act (RCRA), Public Law 94-580, 21 October 1976. This law established standards and guidelines for the management of hazardous and nonhazardous solid wastes. The act introduced and encouraged the practices of waste minimization through source reduction, use of recovered materials (a component of Green Procurement), recycling, and conversion of waste to energy. The RCRA Section 6002 specifically requires the Federal government to promote standards and practices for the procurement of recycled and recovered materials. The act was codified in Title 40, Code of Federal Regulations (CFR) Parts 240-272. Pertinent sections are listed below:

(1) Part 240: Guidelines for the Thermal Processing of Solid Wastes - contains guidance for the operation of solid waste incinerators and thermal processing units.

(2) Part 241: Guidelines for the Land Disposal of Solid Wastes - contains guidance applicable to solid waste land disposal facilities.

(3) Part 243: Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste - establishes requirements and recommended practices for the storage, collection and management of solid waste, and for the operation of vehicles used in the collection, transport, and handling of waste.

(4) Part 246: Source Separation for Materials Recovery Guidelines - contains recycling requirements for the recovery of paper, corrugated containers, and other consumer goods.

(5) Part 247: Guidelines for Procurement of Products that Contain Recycled Material - contains requirements regarding "buy recycled" practices that will stimulate the recovered materials market.

(6) Part 257: Criteria for Classification of Solid Waste Disposal Facilities and Practices - contains criteria for determining whether disposal facilities meet minimum standards to protect human health and the environment.

(7) Part 258: Criteria for Municipal Solid Waste Landfills - establishes criteria and requirements for operating a municipal solid waste landfill, and includes location restrictions, operating criteria, design criteria, ground-water and explosive gases monitoring, and closure and post-closure requirements.

(8) Part 261: Identification and Listing of Hazardous Waste - contains the RCRA definition of a solid waste and lists the criteria for characterization as a hazardous waste.

d. Pollution Prevention Act of 1990, Public Law 101-508, 5 November 1990. The Pollution Prevention Act established a national policy to prevent or reduce waste generation through source reduction, reuse, recycling, and treatment. It introduced the pollution prevention hierarchy of waste management options that is the cornerstone of integrated solid waste management.

e. Federal Facilities Compliance Act, Public Law 102-386, 6 October 1992. This Act required Federal facilities to comply with substantive and procedural requirements of Federal, state, and local solid and hazardous waste regulations. It waived the immunity previously held by Federal facilities.

f. 10 U.S. Code 2577, "Disposal of Recyclable Materials." This regulation contains requirements for the distribution of proceeds generated from installation recycling programs.

g. Military Construction Codification Act of 1982 (Public Law 97-214). This Act was the basis for the regulation 10 U.S. Code 2577, and contains a provision allowing net proceeds

generated from the sale of Qualifying Recycling Program (QRP) recyclables to be used by installations for certain purposes.

h. Executive Orders (EOs).

(1) Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management, 24 January 2007. EO 13423 requires Federal agencies to increase solid waste diversion and to maintain cost-effective waste prevention and recycling programs. The implementing instruction for this order requires Federal agencies to strive to meet the national 35 percent recycling goal established by the EPA. EO 13423 also strengthens green procurement by requiring Federal agencies to expand purchases of environmentally-sound goods and services, including biobased products. This EO also requires Federal agencies to follow certain guidelines when purchasing electronics and to reuse, donate, sell, or recycle 100 percent of electronic products using environmentally sound management practices.

(2) EO 12856, Federal Compliance With Right-To-Know Laws and Pollution Prevention Requirements, 3 August 1993. This order mandates Federal facility compliance with the Pollution Prevention Act.

(3) EO 12780, Federal Agency Recycling and Council on Federal Recycling and Procurement Policy, October 1991. This order encouraged Federal agencies to exercise waste reduction, recycling, and Green Procurement.

i. Army Regulations and Policies.

(1) AR 420-49, Utility Services, 28 April 1997. This regulation calls for the implementation of integrated solid waste management, development of the ISWMP, source reduction to reduce the waste stream, and implementation of a QRP.

(2) Assistant Chief of Staff for Installation Management (ACSIM) Memorandum, 6 February 2006, subject: Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities. This memorandum requires all military construction, renovation, and demolition projects to divert a minimum of 50 percent of C&D waste by weight from landfill disposal and requires that contract specifications will include submission of a contractor's C&D Waste Management Plan. In addition, this memorandum states that installations will achieve the silver level using the Leadership in Energy and Environmental Design (LEED) rating system.

(3) Department of the Army Memorandum, 22 November 2006, subject: Establishment of the Army Green Procurement Program. This policy requires that all Army organizations involved with contracting/procurement actions or credit card purchases comply with Federal Green Procurement requirements.

(4) Green Procurement Guide, August 2006. The U.S. Center for Health Promotion and Preventive Medicine prepared this guide for the Deputy Assistant Secretary of the Army (Policy and Procurement) and the Deputy Assistant Secretary of the Army (Environment, Safety, and

Occupational Health). This guide provides detailed instruction on implementing a Green Procurement program at an Army installation.

j. Department of Defense (DOD) Requirements.

(1) DOD Instruction (DODI) 4715.4, Pollution Prevention, 18 June 1996. This DODI establishes a requirement for installation QRPs, calls for Affirmative (Green) Procurement, and authorizes direct sales of recyclables.

(2) Memorandum, Office of the Under Secretary of Defense, 15 May 1998, subject: Recycling of Firing-Range Scrap Consisting of Expended Brass and Mixed Metals Gleaned from Firing-Range Clearance Through Qualified Recycling Programs. This defines policy for ammunition, explosives, and dangerous articles (AEDA) collected from firing ranges when installations directly sell the metals. Metals must be certified safe before being processed by QRPs, and QRP personnel must be trained to recognize and segregate AEDA.

(3) Assistant Deputy Under Secretary of Defense (Environment) Memorandum, 22 April 2003, Qualified Recycling Program Guidance. This memorandum supplements DOD Instruction 4715.4, paragraph 6.2.3.3 with guidance on QRPs.

(4) Assistant Deputy Under Secretary of Defense (Environment, Safety, and Environmental Health), 12 October 2004, subject: Revised Pollution Prevention and Compliance Metrics. This memorandum supersedes the 1998 DOD Measure of Merit (MoM), which required DOD facilities to ensure the diversion rate for nonhazardous solid waste was greater than 40 percent by the end of FY 05. The revised metric requires DOD facilities to establish a cost-effective solid waste management program that reduces solid waste generation, increases diversion rates, and optimizes cost avoidance. Diversion rates for C&D waste are measured separately from other non-hazardous solid waste diversion rates.

(5) Under Secretary of Defense Memorandum, 27 August 2004, subject: Establishment of the DOD Green Procurement Program. This policy requires installations to implement their own Green Procurement plan and program to provide metrics to achieve the DOD Green Procurement goals.

k. Additional Sources of Information.

(1) Decision-Maker's Guide to Solid Waste Management, Second Edition, EPA 530-R-95-023, August 1995.

(2) Unified Facilities Guide Specification (UFGS), UFGS-015720, Environmental Protection, April 2006 - provides general requirements for solid waste handling, storage, and disposal. Also included are specifications for maintaining and submitting a “Non-Hazardous Solid Waste Diversion Report.”

(3) UFGS-024100, Demolition and Deconstruction, October 2006 – provides requirements for demolition, deconstruction, dismantling, reconditioning and disposal of existing building materials, equipment and utilities as a part of new construction or renovation work.

(4) UFGS-017419, Construction and Demolition Waste Management, January 2007 – covers the requirements for the management of non-hazardous C&D waste materials to include details on the contents of a waste management plan, recordkeeping and reporting, and methods of waste management.

(5) Unified Facilities Criteria (UFC), UFC 1-900-01, Selection of Methods for the Reduction, Reuse, and Recycling of Demolition Wastes, 1 December 2002 – provides guidance for recovery and recycling of demolition waste, and assists in determining the most feasible methods to reduce the amount of C&D waste materials disposed in landfills.

(6) Municipal Solid Waste in the United States: 2005 Facts and Figures, EPA 530-5-06-001, October 2006.

(7) Measuring Recycling - A Guide for State and Local Governments, EPA 530-R-97-011, September 1997.

(8) The Consumer's Handbook for Reducing Solid Waste, EPA 530-K-96-003, September 1996.

(9) Installation Recycling Guide, U.S. Army Engineering and Housing Support Center, TN 420-47-02, 1 September 1991.

(10) Analysis of U.S. Army Solid Waste Management Policy, Army Environmental Policy Institute, July 1992.

(11) Integrated Solid Waste Management, U.S. Army Engineering and Housing Support Center, PWB 420-47-03, 3 May 1993.

l. Supply Catalogues.

(1) 2007 GSA Global Supply Catalog, U.S. General Services Administration. http://www.gsa.gov

(2) DLA Environmental Products Catalog and Information, Defense Logistics Agency (DLA). http://www.dscr.dla.mil/userweb/dscrld/epa/epinfo.htm

m. Web Sites.

(1) U.S. EPA Office of Solid Waste – provides guidance and information on a variety of solid waste topics. http://www.epa.gov/osw/

(2) U.S. EPA Environmentally Preferable Purchasing – the Office of Pollution Prevention and Toxics guidance on green purchasing. http://www.epa.gov/opptintr/epp/

(3) U.S. EPA Comprehensive Procurement Guidelines - contains CPGs and RMANs as well as product information and supplier lists. http://www.epa.gov/cpg

(4) U.S. EPA publications list for landfills – assortment of EPA documents on the subject of municipal solid waste landfills. http://www.epa.gov/epaoswer/non-hw/muncpl/landfill/sw_landfill.htm

(5) Defense Environmental Network Information Exchange – the DOD's comprehensive environmental network provides access to legislative, compliance, restoration, cleanup, and DOD guidance and information. http://www.denix.osd.mil/

(6) Office of the Federal Environmental Executive – provides direction and policies for the national challenges of source reduction, recycling, and green procurement. http://www.ofee.gov/

(7) Code of Federal Regulations – online access and search of the CFR to provide the public with enhanced access to codified regulations. http://www.gpoaccess.gov/cfr/index.html

(8) Solid Waste Association of North America – an educational association and advocacy group for solid waste professionals in the public and private sector. http://www.swana.org/

(9) Waste Prevention World – part of the California Integrated Waste Management Board, this focuses on source reduction. http://www.ciwmb.ca.gov/WPW/

(10) National Recycling Coalition – dedicated to increasing awareness of recycling and relaying the positive impact of recycling. http://www.nrc-recycle.org/

(11) Global Recycling Network – a business-oriented free-access site dedicated to recycling information. http://grn.com/grn/home.htm

(12) Construction Criteria Base - an extensive electronic library of construction guide specifications, manuals, standards and many other essential criteria documents. http://www.ccb.org

3. **PURPOSE**. The ISWMP must have an explicit statement of purpose including at least the following elements:

a. To define and document the installation's current solid waste management program.

b. To set forth goals, targets, and objectives for improving solid waste management through the practices of source reduction, recycling, and Green Procurement.

c. To specify the strategies and responsibilities for achieving those goals.

d. To meet the Army requirement to develop an ISWMP.

4. **PROGRAM OBJECTIVES**. The plan should set forth major program objectives to include at least the following:

a. To effectively manage solid waste in a manner that protects human health and the environment.

b. To comply with applicable Federal, state, local, and Army solid waste management regulations.

c. To reduce the volume of solid waste generated to meet or surpass state, DOD, and Army waste reduction goals.

d. To reuse or recycle elements of the solid waste stream to the maximum extent possible.

e. To integrate elements of the installation Green Procurement Plan affecting waste generation rates.

5. **BACKGROUND INFORMATION**. Provide background information about the installation to include the following.

a. Location. Identify the state, county, and municipality. Briefly discuss the solid waste management options in the region (e.g., use of landfills, incinerators, and recycling programs). More detailed information should be provided under "Planning Factors." The distances to nearby cities may be notable in order to gauge distances to recycling centers, vendors, or municipal disposal facilities. Descriptions of the climate, physiographic location, and natural borders to the installation (rivers, mountains, etc.) may also be useful.

b. Current Land Use. Summarize the land use within the installation boundaries, such as percent housing, administration, industrial, disposal/transfer facilities, training, firing ranges/impact areas, and wetlands.

c. Mission. State the current and future mission(s) of the installation.

d. Population.

(1) Current. State the population of the military and civilian work force and number of on-post residents.

(2) 10- and 20-Year Projection. State the projected military and civilian work force, and number of residents, if available.

e. Master Plan. Report any planned major constructions, demolitions, or alterations in land use which could affect solid waste generation.

f. Planning Factors. Briefly identify the major factors affecting solid waste management planning and decision-making at the installation. These should be discussed in greater detail under Section 15, FACTORS AFFECTING SOLID WASTE MANAGEMENT DECISION-MAKING, but may be summarized here to provide an overall picture of the installation's solid waste situation and constraints. Such factors may be regulatory, economic, environmental, political, operational, or logistical. Factors to be considered may also relate to the size, mission, location, or closure/realignment status of the installation.

BACKGROUND INFORMATION
How Much Is Too Much?

The background information in the ISWMP should be installation-specific and relevant to some aspect of solid waste management. Lengthy descriptions of the installation's environmental setting are not necessary, but the ISWMP may include references to documents containing such information. Descriptions of past disposal practices or past disposal sites are not needed unless they warrant consideration in assessing current or future practices. Generally, contents should focus on current solid waste practices and programs as well as future plans. If installation waste characterization data are unavailable, a pie chart or table showing national or state waste generation rates and recycled material breakdowns would help set the stage for the installation's solid waste planning. Recommended Source: The State of Garbage in America, Annual Biocycle Nationwide Survey, Biocycle Journal of Composting and Recycling.

6. **RESPONSIBILITIES**. Specify the responsibilities, both individual and organizational, for all aspects of solid waste management. The following paragraphs contain examples of roles and responsibilities in the solid waste management program. Installations must tailor these to fit their particular needs. For example, at some installations the recycling program is managed by the Director of Public Works (DPW) and at others by the Director of Community Activities (DCA). The recycling program responsibilities should reflect the actual program management structure.

a. Garrison Commander.

(1) Establish and/or maintain a functional organizational structure to plan, execute, and monitor the solid waste program.

(2) Provide command emphasis on solid waste reduction, materials reuse, recycling, Green Procurement, and composting.

(3) Formally establish an installation recycling program or QRP (see text box) and designate the installation activity responsible for oversight of the program.

(4) Chair the Environmental Quality Control Committee (EQCC) or other installation forum that addresses solid waste management and recycling issues.

(5) Ensure that the proceeds from the QRP are used in accordance with Public Law 152 and DOD Instruction 7310.1.

(6) Support recycling programs by ensuring that the Green Procurement requirements of Executive Order 13423 are met, and designate the installation activity responsible for oversight of the program.

b. All Directors.

(1) Advise directorate activities of state, Federal, and Army requirements for managing and reducing solid wastes, recycling, and Green Procurement.

(2) Monitor directorate activities for compliance with state, Federal, and Army solid waste management requirements, and recommend changes in policies or procedures to improve program management when necessary.

(3) Support and emphasize the practices of waste reduction, Green Procurement, recycling, and yard waste composting.

(4) Ensure that all required training is approved, resourced, accomplished, and documented.

(5) Participate in the EQCC or installation forum that addresses solid waste management and recycling issues.

c. Director of Public Works (DPW).

(1) Ensure that solid waste storage, collection, transportation, and disposal are conducted in accordance with state, Federal, and Army regulations.

(2) Program, budget, and support the resource requirements to manage the solid waste program, to comply with Federal, state, and Army regulations, and to achieve state and DOD waste reduction goals.

(3) Serve as the Commander’s expert representative for the management of solid wastes. Recommend changes in policies or procedures to improve program management to the Commander in coordination with the Solid Waste Manager.

d. Director of Resource Management (DRM).

(1) Ensure that proceeds from the recycling program are used in accordance with Public Law 152 and U.S. Code 2577 and according to the Commander's direction.

(2) For QRPs, the Finance and Accounting Office will establish and maintain a clearing account for the deposits of proceeds and ensure that all collections are accumulated in that account.

e. Director of Community Activities (DCA).

(1) Actively promote the recycling program based on input from the QRP manager.

(2) Ensure that Comprehensive Procurement Guidelines are followed in applicable purchase requests and purchasing contracts.

f. Director of Logistics (DOL).

(1) Advise procuring activities on the availability of environmentally preferable products and Green Procurement requirements.

(2) Seek ways to reuse and reduce packaging and packing materials.

(3) Actively support the environmental office in measuring progress to meet waste reduction goals and Green Procurement requirements.

(4) Communicate regularly with the DRMO to maintain current information on markets for excess or unserviceable materials and recyclable materials.

g. Director of Contracting (DOC).

(1) Ensure that construction and procurement contracts meet Federal Green Procurement requirements and source reduction strategies, as follows:

(a) Require the use of environmentally preferable products where applicable, including those containing recycled or biobased content, using less energy, and/or containing less or reusable packaging.

(b) Stipulate in contracts that paper products contain 30% recycled content paper or are printed on tree-free paper, and that contractor documents be printed double-sided.

(c) Include the requirement to follow Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings as specified in EO 13423, and specify that new construction achieve a LEED rating of silver or higher.

(d) For building deconstruction (demolition) contracts, ensure measures for the salvaging, reuse, and recovery of materials are incorporated by requiring contractors to provide and follow a waste management plan.

(2) For construction and demolition contracts, include provisions for quantifying the materials diverted from the waste stream.

h. Contracting Officer's Representatives (CORs).

(1) Periodically review the solid waste management contracts for overall effectiveness and monitor the performance of the contractor. Evaluate such factors as number, size, and location of pickup stations, truck routes, types of equipment, scheduling, supervision, and effective use of manpower.

(2) Coordinate with the QRP manager to develop strategies for improved recycling and, if necessary, modify contracts to implement those strategies.

(3) Include provisions for Green Procurement and recycling in all contracts as appropriate. Example of types of contracts include: construction, deconstruction, janitorial, supply/procurement, engineering/design, and utilities.

(4) Ensure that all military construction, renovation, and demolition projects include contract performance requirements for a 50 percent minimum diversion of C&D waste, by weight, from landfill disposal.

(5) Ensure that all construction and demolition contractors submit a C&D Waste Management Plan.

(6) Periodically review recycling contracts for overall effectiveness and monitor the performance of the contractor.

i. Chief, Environmental Division (and/or Solid Waste Manager).

(1) Identify a person to be responsible for managing the solid waste program. The solid waste manager may also be designated to assume any or all of the responsibilities listed below.

(2) Periodically review and monitor compliance with all applicable state, Federal, and Army requirements for solid waste management and recycling. Ensure compliance at tenant activities and subinstallations.

(3) Determine the most cost-effective and efficient means of source reduction, recycling, and waste storage, collection, treatment, and/or disposal.

(4) Recommend changes in policies or procedures to improve program management when necessary.

(5) Advise all waste-generating activities of Federal, state, and Army requirements for managing solid wastes, including requirements for permitting, reporting, and recordkeeping.

(6) Serve as the installation point of contact for questions, complaints, or other notification regarding solid waste management and recycling.

(7) Ensure sufficient funding levels to comply with regulatory requirements and support waste reduction initiatives.

(8) Oversee all aspects of the solid waste program including source reduction, resource recovery, and recycling.

(9) Maintain liaison and coordinate as necessary with county and state solid waste regulators.

(10) Maintain liaison with and request support from the major command on solid waste related issues.

(11) Report solid waste management activities to the major command using the Solid Waste Annual Reporting Web-based system (SWARWeb).

(12) Review contracts related to solid waste management for environmental compliance.

(13) Provide guidelines on source reduction strategies, yard waste management, pollution prevention, and recycling to on-post residents and installation personnel.

(14) Report to the EQCC or other installation forum on a regular basis on issues related to solid waste management and recycling.

(15) Identify and monitor responsibilities of all providers of solid waste management services, whether contractors or in-house personnel. Ensure that formal procedures are followed to for performance assessment. Enforce, through the COR, compliance with contract specification.

j. Recycling Program/QRP Manager.

(1) Oversee daily operation of the recycling facility and all recycling operations.

(2) Hire and supervise personnel to accomplish recycling duties.

(3) Ensure proper training of facility personnel. Training may include AEDA certification if the installation operates a QRP that handles firing range scrap.

(4) Request, justify, and procure equipment necessary to perform recycling operations.

(5) Develop and manage contracts in support of the program.

(6) Develop, implement, and update SOPs for operation of the program.

(7) In coordination with Resource Management personnel, establish and oversee a recyclable materials accounting procedure to track the materials processed/sold and a financial accounting system for the receipts and disbursements of funds.

(8) Address customer complaints regarding the recycling program.

(9) Monitor participation in the program and implement corrective measures when participation is poor.

(10) Implement an aggressive promotional and educational campaign for the recycling program.

(11) Maintain a list of recycling POC's in each activity or building and coordinate the program's activities and changes through them.

(12) Assist the solid waste manager in reporting recycling activities to the major command using the SWARWeb system.

(13) Report on the status of the recycling program to the EQCC or installation forum that addresses solid waste management and recycling issues.

k. Installation Safety Manager. Ensure compliance with state, Federal, Army, and other safety standards, guidelines, and training requirements related to solid waste management and recycling.

l. Environmental Quality Control Committee (EQCC) or Other Installation Forum. Include solid waste management issues on the meeting agendas. These meetings will provide a forum for planning, identifying needs and objectives, and coordination among various installation elements. Participation should include the Installation Commander and/or Garrison Commander; recycling program manager; DPW; Environmental Office, DRMO, DCA, DOC, DOL/Supply, Safety Office, Public Affairs, and Staff Judge Advocate.

m. Defense Reutilization and Marketing Office (DRMO).

(1) Accept qualified recyclable materials from the QRP, and reimburse installations the designated proceeds from the sale of recyclables in accordance with current DLA policy and DLA financial management regulations.

(2) Accept materials excluded from QRPs for recycling or other disposal, deposit the recycling proceeds, if any, to the U.S. Treasury, and report material sales data to the QRP within the required reporting time frame.

(3) Serve as the local representative of the DLA.

(4) Assist the recycling program manager by providing technical advice, performing market research, and selling recyclable commodities, when requested.

(5) Advise generating activities on the required turn-in procedures, including packaging, labeling, and transporting of materials to facilitate sales/recycling.

(6) Assume accountability for materials properly turned in for disposal, resale, or recycling.

(7) Periodically conduct sales, and/or make the DOD bidders list available to activities conducting direct sales of recyclables.

(8) Maintain records concerning types and quantities of materials turned in, and proceeds for various resale/recycling activities.

n. Defense Finance and Accounting Service (DFAS). Process financial documents and vouchers forwarded from the DRMO or DOD Components. The proceeds are deposited into the installation QRP account as directed in accordance with 10 U.S.C. 2577. DFAS also tracks DD Form 1348-1, Disposal Turn-In Document, and ensures timely and accurate financial recording of sales of recyclables.

o. All Installation Organizations, Units, and Tenant Activities.

(1) Reduce the amount of solid waste generated through procurement of products with less or reusable packaging, buying only the amounts needed, investigating new recycling/ reuse opportunities, and altering operations to reduce wastes (e.g., using double-sided copies).

(2) Support recycling by procuring items with recycled materials content.

(3) Ensure safe and effective solid waste management through the proper storage of solid wastes and recyclables.

(4) Support the recycling program by identifying, collecting, separating, and removing contaminants from all potential recyclable materials.

(5) Designate a recycling coordinator to organize the recycling efforts, coordinate with the recycling program manager, and participate in the installation forum that addresses solid waste management and recycling issues.

(6) Coordinate with the installation environmental office on all matters involving solid waste management, Green Procurement, recycling, or pollution prevention.

7. **GENERATION OF SOLID WASTE AND RECYCLABLES.** The basis for all solid waste management decision-making is a characterization of the wastes generated. The characterization involves identifying each element of the waste stream, identifying the primary sources of each element, and measuring the amounts generated for each. This may be accomplished through in-house recordkeeping, a contractor survey, or by Army support agencies. Estimates of waste generation can by made using data from generator interviews, solid waste removal/disposal contracts, waste hauler records, disposal facility records, turn-in documents, records from the environmental office and DRMO, and interviews with key personnel. More accurate data can be obtained by performing a field waste characterization study (dumpster dive) in which wastes are sorted and weighed at the site of generation. A waste characterization study may or may not

have been performed at the installation, and is usually beyond the scope of developing the ISWMP. Provide generation rates in units of weight (pounds or tons) rather than volume (cubic yards), since it is an Army policy to collect standardized data by weight.

DEFINITION OF SOLID WASTE

Solid waste, as defined in RCRA, is any garbage, refuse, sludge, or other discarded material resulting from industrial, commercial, institutional, and residential activity. Discarded materials include those that are disposed of, abandoned, recycled, or are inherently waste-like. Hazardous wastes are solid wastes that meet specific RCRA or state criteria involving hazardous characteristics or the presence of listed constituents. For the purposes of this ISWMP, hazardous wastes are not included. Hazardous wastes generated at the installation are addressed in the Hazardous Waste Management Plan.

a. Estimating or Measuring Waste Generation Rates. There are several methods of measuring or estimating the amounts of solid waste generated. Waste generation rates should be documented in the IWSMP using available data or by estimating using the following procedures.

(1) A field waste characterization study will provide relatively accurate data on solid waste and recyclables generation rates. It involves direct measurement of waste generation and should follow a systemic, standardized approach such as the ASTM standard D5231-92 (2003). Factors that must be considered in the study are seasonal and climatic variations, large influx or exodus of families and soldiers, and changes in recycling efforts. A field waste characterization study can be performed by the USACHPPM. Call (410) 436-2024 for information.

(2) A method of measuring total solid waste generation (excluding recyclables) is weighing refuse collection vehicles as they enter and leave the installation. Unfortunately, most installations do not have truck scales. Collection vehicles are typically weighed at disposal sites; however, a given load may include wastes from sources other than the installation. Therefore, waste hauler records may not accurately reflect an installation's generation rate. Also, no material specific data are obtained.

(3) Many installations measure solid wastes by converting container volumes to weights. While this may be one of the easiest methods, drawbacks include the inability to accurately estimate the container fullness and the fact that different waste types have different volume/weight ratios. These factors, if not taken into consideration, reduce the accuracy of using this conversion process to obtain the data.

(4) Another way to estimate quantities of specific wastes is to make the estimates based on typical municipal waste stream breakdowns. This method can only be used for a few waste categories, and may not accurately address the unique wastes generated on Army installations.

b. Waste Characterization. The ISWMP should include types and quantities of various wastes generated in the following categories.

(1) Residential Waste. Indicate the number of households or buildings serviced. Provide (if data are available) or estimate the amounts of refuse disposed from on-post residents and the amounts of each material recycled. Note: If family housing has been privatized, waste and recyclables will not be reported in the SWARWeb database.

RESIDENTIAL WASTE

Residential waste typically includes wastes from single and multi-family dwellings, BOQ's, and troop housing. This waste may be the most easily characterized and measured, and usually consists of paper, glass, metal, plastics, food wastes, bulky items, furniture, electronics, and yard waste. In most cases, recyclable materials are segregated from other wastes for separate collection.

(2) Commercial and Institutional Waste. List the major generators of commercial and institutional waste and identify the recyclable materials. Provide data for or estimate the amounts of refuse and recyclable materials generated.

COMMERCIAL AND INSTITUTIONAL WASTE

In some cases, this type of waste is removed by a solid waste contractor and disposed of in an off-post landfill. Waste hauler records or landfill logs should provide estimates, although these may not be accurate. The best way to characterize and measure these wastes is to perform a waste characterization study (dumpster dive). Facilities include administrative offices, commissaries, food service operations, medical facilities (not including regulated medical wastes), warehouses, post exchanges, schools, and laboratories. Typical wastes include paper, food wastes, cardboard, clothing and textiles, furniture, computers and other electronics, and packing materials.

(3) Industrial (Non-hazardous) Waste. Estimate or specify (if available) the types and quantities, locations generated, and special handling/disposal requirements.

INDUSTRIAL WASTE

The best way to characterize and measure these wastes is to perform a waste characterization study (dumpster dive). Wastes may include materials discarded from industrial operations and manufacturing processes, such as scrap metals, non-hazardous solvents, greases and oils. Examples of activities that are sources of industrial waste are: motor pools, paint shops, service stations, maintenance shops, craft shops, and auto craft shops.

(4) Construction/Demolition (C&D) Waste. Identify ongoing and planned C&D projects and the parties responsible for the management of C&D debris. Include existing C&D waste quantity data and evaluate future provisions (through contracts) for obtaining C&D waste management data.

DEMOLITION OR DECONSTRUCTION?

Army policy calls for minimizing the amount of disposal of solid wastes in landfills or incinerators, and promoting the use of environmentally preferable construction materials including those with recovered content. The selective method of disassembling buildings to preserve and separate potentially recyclable materials is called deconstruction.

Since most major construction/demolition projects are performed by contractors, the best way to obtain information on the associated waste streams is by reviewing the contracts or contacting the COR. Typical wastes include lumber, timber, reinforcing steel, pipes, wires, concrete, brick, plaster, metal, wall board, roofing, insulation materials, and asphalt. Every effort should be made to salvage materials for sale/reuse or recycle them in lieu of landfilling or incineration.

(5) Yard Waste. Estimate the quantity of yard wastes generated by grounds keeping activities and residential yard maintenance or indicate results of waste characterization study.

YARD WASTE

Data on yard waste generation rates may be available at the installation compost facility if one exists. If yard wastes are composted in a municipal compost facility, the data may be available at that facility or the data may be maintained by the DPW grounds keeping activity. If yard wastes are not segregated from the waste stream, it is difficult to estimate generation rates. Yard wastes typically include grass, weeds, and trimmings from trees and shrubbery.

(6) Other Special Wastes. Indicate the types and quantities of non-hazardous, special wastes generated (wastes that are not disposed as refuse and are not handled through the recycling program).

SPECIAL WASTES

Commercial and industrial activities on the installation can result in the generation of certain non-hazardous solid waste that cannot be disposed of as general refuse. Information on management of these wastes can be obtained from either the solid waste program manager or the hazardous waste program manager. Some examples of special wastes are: computers and other electronics, waste oil, absorbents with petroleum produces, tires, ash, photographic chemicals, scrap metal, adhesives, non-RCRA cleansers, latex paint, water treatment/wastewater treatment sludges, dead animals, pallets, batteries, antifreeze, asbestos, kitchen grease, pesticide containers, pollution control residuals, and septic tank wastes.

8. **SOURCE REDUCTION**. Document all of the source reduction practices at the installation and strategies for further waste reduction. Also describe any occurring or planned procurement efforts or programs. Source reduction can be achieved through green procurement programs, innovative buying policies aimed at waste reduction, pollution prevention, material reuse, donation, process alterations, and management practices that minimize waste generation.

WHY SOURCE REDUCTION?

In the Pollution Prevention Act of 1990, EPA designated source reduction as the highest priority for effectively managing the solid waste stream. Benefits are derived from reducing solid waste in the form of natural resource conservation, reduction in treatment/disposal costs, and removal of risks and liabilities associated with disposal. Source reduction differs from recycling in that it focuses on reducing the waste stream at the source, to include procurement policies (environmentally preferable purchasing) and the way products are used (and reused). Source reduction, according to the EPA definition, also includes the reuse of materials with little or no "processing" involved. Planning and implementing source reduction measures play a vital role in meeting waste reduction goals.

a. Green Procurement (GP).

(1) GP Overview. Green Procurement is the purchase of environmentally beneficial products and services in accordance with one or more of the established Federal procurement preference programs. Federal Agencies are required to establish a GP Program to meet the requirements of the EPA "Buy Recycled" program and the Department of Agriculture "BioPreferred" program. The GP program includes the following categories: recovered materials, environmental preferable, energy and water efficient, biobased, alternative fuels and fuel efficiency, non-ozone depleting substances, priority chemicals, Electronic Product Environmental Assessment Tool-registered electronic products, and sustainable buildings.

THE ROLE OF GREEN PROCUREMENT IN INTEGRATED SOLID WASTE MANAGEMENT

GP has many environmental benefits, including creating markets for recycled and biobased materials, conserving resources, saving energy, saving landfill space, and reducing pollution. The types and amounts of wastes generated on an installation are a direct result of the products purchased and used. Making better choices of products, such as those with reduced packaging or lower toxicity, impact the rates of generation, disposal methods, and cost of disposal. Although a many GP practices do not actually reduce amounts of wastes generated, GP is considered a key component of integrated solid waste management. Buying products with recycled content "completes the circle," stimulating the market for recycled materials, conserving natural resources, and saving energy otherwise used to make products from virgin materials.

(2) GP Mandates. In 2004, DOD issued a GP policy that reaffirmed a goal of 100 percent compliance with Federal laws and EOs requiring the procurement of green products and services. The policy was accompanied by a strategy document that outlines steps for meeting those requirements and contains metrics for measuring progress. The Army also published a GP policy in November 2006 formalizing the Army commitment to GP compliance. The Army Green Procurement Guide provides detailed instruction on implementing a GP Program at an Army installation. The primary regulatory drivers are the Resource Conservation and Recovery Act Section 6002, the Federal Acquisition Regulations (FAR) Part 23, EO 13423, and the 2002 Farm Security and Rural Investment Act (FSRIA). 40 CFR 247 contains the Comprehensive Procurement Guidelines (CPG), which include a list of products designated by the EPA, for which Federal purchasers must buy products containing recovered material. Title IX of the FSRIA requires Federal Agencies to show preference for biobased products as part of their GP programs. The U.S. Department of Agriculture designates items that must contain biobased content. EPA- and USDA-designated product lists are available on internet at http://www.epa.gov/cpg/ and http://www.biobased.oce.usda.gov/fb4p/, respectively.

(3) ISWMP Input. Briefly summarize the installation's GP program and reference the GP Plan (if one exists). If the installation does not have a formal GP program, briefly describe any efforts being made and recommend that actions be taken to develop a GP program. Detailed GP guidance or plans are beyond the scope of the ISWMP. Provide examples of the installation's current and planned buying practices that will accomplish source reduction and/or improve recycling markets such as:

(a) Procuring materials with less packaging.

(b) Purchasing materials that are recyclable.

(c) Purchasing items that are reusable.

(d) Procuring products made with recovered material.

b. Pollution Prevention. Reference the installation's pollution prevention plan, and briefly list the ways that material substitutions, process changes, or other methods are used to reduce the toxicity or quantity of wastes generated.

POLLUTION PREVENTION

The Pollution Prevention Act of 1990 established P2 as a national objective in reducing wastes at the source. This is achieved by lessening the toxicity and/or the quantity of the waste generated, through such tools as material substitution, procurement policies, or process changes. Many of the P2 measures taken will effectively reduce the generation of solid waste. In some cases, however, reducing the use of hazardous constituents in a process results in the creation of more non-hazardous solid waste. This is an acceptable trade-off. The installation should maintain a separate P2 plan (possibly as part of the Hazardous Waste Management Plan) in accordance with Army requirements.

c. Reuse. Identify areas where materials may be reused rather than discarded. An example is the reuse of packaging material, to include styrofoam peanuts, bubble wrap, and cardboard boxes in good condition. If not already in place, include plans for creating a waste exchange within the installation where activities can transfer usable items to other activities.

REDUCED PACKAGING -
A GOOD PLACE TO START

It is estimated that over one-third of the solid waste stream consists of packaging materials, including various types of cardboard, paper, plastics, and styrofoam. Therefore, reducing or eliminating this waste component will significantly reduce the wastes generated. Purchasing items with reduced packaging (or reusing the packing materials) is an effective means of reducing this waste. The installation should reduce packaging waste by evaluating purchases according to the following packaging preferences:

- *Products sold in bulk, with little or no packaging*
- *Minimal packaging or use of lightweight packing materials*
- *Returnable packaging (returned to manufacturer)*
- *Reusable or refillable packaging*
- *Recyclable, homogenous packaging (as opposed to layers of several materials)*
- *Packaging made with recycled materials*

d. Management Practices. Identify everyday management practices used (or planned) that reduce wastes. Describe how personnel are informed of these practices. Examples are shown in the text box below.

ADMINISTRATIVE WASTE REDUCTION PRACTICES

- Eliminate stockpiling materials; order only what will be used
- Using e-mail in place of written memos whenever possible
- Saving e-mail messages to files rather than printing out
- Sending mail in reusable "shotgun" envelopes
- Reusing file folders (put stick-on labels over previous folder labels)
- Using routing slips in place of multiple copies
- Using old documents for scratch paper
- Using word processing features to condense pages, using less paper
- Using "print view" features to reduce printing mistakes and paper waste
- Returning toner cartridges for remanufacturing
- Making double-sided copies
- Providing proper maintenance for copiers and printers
- Saving binders for reuse
- Using reusable materials rather than disposable materials (for example coffee mugs instead of styrofoam cups)

9. **INSTALLATION RECYCLING PROGRAM**. A list of possible topics to be addressed in the ISWMP pertaining to recycling follows. More information may also be found under Section 12, SOLID WASTE MANAGEMENT FACILITIES, paragraph f, Recycling Facilities.

a. Program Status. Indicate whether the program is a "Qualifying Recycling Program." See text box below.

RECYCLING PROGRAMS - THE QRP

Section 2e of Executive Order 13423 mandates that each Agency increases diversion of solid waste as appropriate, and maintains cost-effective waste prevention and recycling programs in its facilities. This takes the form of a QRP when funds received from the sale of recyclables are returned to the installation's recycling account, and in turn distributed to environmental, safety, and MWR programs. The EO also requires that each installation has a designated recycling coordinator.

b. Program Structure. Indicate the proponent organization and general type of recycling program (curbside, mixed or segregated collection, labeled dumpsters, drop-off centers, etc.).

c. Recycled Materials. Identify all of the materials that are recycled on the installation and the mechanism through which they are recycled. For example, indicate that paper and cardboard are recycled through the QRP, and batteries and tires are recycled through the DRMO. Identify recyclable materials that may be added in the future.

d. Segregation, Storage, and Collection Procedures. Indicate how recyclable materials are stored and collected. Some or all of this information may be documented in the solid waste storage and collection section of the plan.

(1) List the turn-in or preparation requirements for all recyclables.

(2) Specify container and labeling requirements for all recyclables collected.

(3) If recyclables are commingled with other solid wastes, indicate how and where the segregation/processing will occur.

(4) If firing range scrap is collected and processed through the QRP, include the following: a list of personnel authorized to certify firing range scrap from range clearance as safe; procedures and responsibilities for identification, collection, and processing of firing range scrap; and procedures for turning in other AEDA scrap to DRMO.

e. Contracted Operations. Identify whether the collection, processing, or sale of recyclables is performed by a contractor. Indicate how revenue is returned to the installation (i.e., direct payment, contract discounts, rebates).

f. Facilities, Equipment, and Personnel. Describe the facilities, equipment, and personnel directly involved in operation of the QRP. Include plans for new or expanded facilities, new equipment, or personnel changes.

g. Regulations, Policies, and Procedures. List the installation regulations, policies, and procedures established for the recycling program. They may be incorporated into an installation regulation, policy, or Standing Operating Procedures (SOP). It may be appropriate to include some or all of these documents as appendices in the ISWMP.

h. Publicity and Promotion. Identify the mechanisms for promoting the recycling program to installation elements, tenant organizations, and on-post residents. Details on promoting the QRP may be documented as a separate section. See Section 13.

i. Relationship with Local Recycling Programs. Indicate whether recycling programs have been established in the local community, and to what extent the installation is participating or plans to participate. Army policy prohibits using on-post facilities for acceptance of off-post materials or wastes.

j. Market Research. Identify who is responsible for investigating local and national markets for recycled materials. Briefly describe the procedures for researching markets and locating vendors.

k. Funding and Financial Accountability. Describe funding mechanisms and procedures for operating the recycling program. Briefly describe the accounting procedures associated with the sale of recyclables and the distribution of proceeds.

l. Calculation of Diversion Rate. Indicate the calculated diversion rate. Perform the calculation with available data if the installation has not done so.

DIVERSION RATE CALCULATION

The diversion rate is the rate at which non-hazardous solid waste is diverted from entering a disposal facility. Disposal facilities include landfills (both solid waste and inert) and incinerators. Composting, mulching, recycling, reuse, and donation are generally accepted waste diversion methods. The diversion rate equals:

(R/(R+L))*100 = diversion rate (per cent)

R = amount (in tons) of non-hazardous solid waste (including construction and demolition debris) that is composted, mulched, recycled, reused, donated, or otherwise diverted from a disposal facility.

L = amount (in tons) of solid waste (including construction and demolition debris) transferred to a disposal facility.

m. Recordkeeping. Describe the documentation procedures associated with management of the QRP to include financial management.

10. **COMPOSTING**. The ISWMP should describe the current composting activities and should address any plans for new or expanded composting.

THE DIRT ON COMPOSTING

Composting is an aerobic degradation process that decomposes plant and other organic waste under controlled conditions. Programs may consist of yard wastes only (leaves and grass clippings) or may be a compostable municipal solid waste program, using yard wastes, food wastes, and other degradable organic matter. Composting procedures include collecting wastes, forming wastes into windrows or placing in a vessel, and aerating the material until an organic-rich material is produced. Backyard composting is operated by individual homeowners with little or low technology equipment. End uses include mulches and soil conditioners used in landscaping and gardens. For more information about composting, refer to CHPPM Technical Information Paper #38-001-1203.

a. Yard Waste Composting.

(1) State whether any "backyard" composting is performed by residents. Estimate the quantity of yard waste diverted from disposal and the number of participants.

(2) If a centralized program exists, state the quantity of yard wastes collected, the frequency of collection, the size of the compost area, the management procedures used, the equipment used for aeration, and end uses for the material.

(3) Identify alternative end uses for the compost product if a surplus exists.

(4) Describe any state permit/operational requirements for composting and discuss how they are implemented and monitored.

(5) Describe educational and promotional programs associated with composting or reference the section on Program Promotion (see Section 13).

(6) Determine cost avoidance associated with the diversion of yard waste from the solid waste stream and with the reduced purchasing of compost products from outside sources.

b. Municipal Solid Waste Composting.

MUNICIPAL WASTE COMPOSTING

MSW composting is a developing waste management technology and may not be in use at most installations. A large amount of manual and mechanical pre-processing may be required to segregate the compostable portion from the waste. The compostable portion (yard wastes, food wastes, and paper) can comprise from 30 to 60 percent of the waste stream. Removal of other recyclables may take place at the source, in a curbside collection, or as a pre-screening stage. MSW composting usually involves the construction of "digesters" or in-vessel systems or enclosed chambers for windrow piles with mechanical turning equipment.

(1) Describe the facility used to include building size, mechanical equipment, storage and processing areas.

(2) Provide the permit number and pertinent permit specifications.

(3) Describe the operating procedures and include the SOP as an appendix.

(4) State the facility's capacity in cubic yards and determine the monthly or annual tons of input and product.

(5) Provide details on the waste process stream, including any pre-processing for recyclables and non-compostable materials, and the MSW composting digester (in-vessel) systems or chambers for windrow piles.

(6) Describe end uses for the materials and identify additional end uses if surplus compost exists.

(7) Determine cost avoidance associated with the diversion of yard waste from the solid waste stream and with the reduced purchasing of compost products from outside sources.

(8) Describe educational and promotional programs associated with composting or reference the section on Program Promotion (see Section 13).

11. **CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.** Include a description of how the installation is meeting or will meet the Army requirements for sustainable management of C&D waste. This includes requirements for achieving a 50% diversion rate, attainment of a LEED rating of silver or above, and submission of a contractor's C&D Waste Management Plan. Recordkeeping and reporting requirements are addressed in paragraph 15.b. Determine if existing C&D contracts contain requirements for C&D waste management procedures, plans, and reporting. If in compliance, briefly describe the procedures in place to ensure compliance with the Army C&D waste management policies. If not in compliance, indicate plans to make the necessary procedural changes to achieve compliance and include these as action items. Army policy requires C&D Waste Management Plans as described in UFGS-017419 and containing the following elements:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

e. Characterization, including estimated types and quantities, of the waste to be generated.

f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.

i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.

j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.

k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

12. **SOLID WASTE AND RECYCLABLES STORAGE, COLLECTION, AND DISPOSAL**. This section is organized according to the major waste types because the different waste types are often stored, collected, or disposed in different ways.

a. Residential Wastes/Recyclables.

(1) State whether residential wastes and recyclables are collected using in-house resources or by contract. If contracted, include a copy of the collection contract as an appendix.

(2) List the types, sizes, and locations of solid waste/recycling containers.

(3) Include the collection schedules as an appendix.

(4) If collection is accomplished using in-house resources, describe the equipment and personnel associated with the service.

(5) Detail the procedures for closing, cleaning, and maintaining the containers, or describe the inspection program if the responsibility lies with a contractor.

(6) List any specific storage requirements such as segregation or preparation of recyclables, segregation of yard wastes, or segregation of bulky wastes.

(7) Describe the recordkeeping procedures associated with solid waste collection. Haulers should be required to measure the wastes collected, either by using a truck scale or estimating the amounts of wastes during each pickup (Forms DA 3916 and DA 3917 - see Section 14, paragraph d for more information).

(8) State the disposal method for the wastes and refer to Section 12.

b. Offices and Other Facility Wastes and Recyclables. These may be addressed with the residential wastes if storage and collection procedures are similar (performed by the same contractor, for example.)

(1) State whether office wastes and recyclables are collected using in-house resources or by contract. If contracted, include a copy of the collection contract as an appendix.

(2) Describe the janitorial service provided for refuse and recyclables collection.

(3) List the types, sizes, and locations of solid waste/recycling containers.

(4) Include the collection schedules as an appendix.

(5) If collection is accomplished using in-house resources, describe the equipment and personnel associated with the service.

(6) Detail the procedures for closing, cleaning, and maintaining the containers, or describe the inspection program if the responsibility lies with a contractor.

(7) Describe the mechanism for evaluating whether containers are the right size and whether wastes are collected at appropriate frequencies. Examples are performing routine inspections of containers just prior to waste pickups, or requiring the waste hauler to record any problems with waste storage.

(8) List any specific storage requirements such as segregation or preparation of recyclables or segregation of bulky wastes.

(9) Describe the recordkeeping procedures associated with solid waste collection. Haulers should be required to measure the wastes collected, by either using a truck scale or estimating the amounts of wastes during each pickup (Forms DA 3916 and DA 3917).

(10) State the disposal method for the wastes and refer to Section 12.

c. Yard Wastes. Describe the procedures for segregating, containerizing, and collecting yard wastes. Specify number and sizes of containers. Include the collection schedule as an appendix. Address both residential yard waste handling and post-wide facilities grounds keeping waste handling, as these may be handled differently. State whether yard wastes are composted and, if so, refer to Section 10.

d. Construction/Demolition Wastes and Recyclables. Describe the equipment and procedures used for storage and collection of C&D wastes. Identify any recyclables that are separated from the waste materials. Determine if requirements for contractors to submit and follow waste management plans are being met. If the installation operates a construction/demolition landfill, refer to Section 12.

e. Special Wastes. Describe the storage and handling of the special wastes identified in Section 7b(6). Identify any special wastes that are recycled and by what mechanism they are recycled (e.g., under contract to the environmental office, through DRMO, through the QRP). For special wastes that are not recycled, state how and where the materials are disposed. Include any plans for the future recycling of special wastes currently being disposed of. Some examples of special wastes are: computers and other electronics, waste oil, absorbents with petroleum products, tires, ash, photographic chemicals, scrap metal, adhesives, non-RCRA cleansers, latex paint, water treatment/wastewater treatment sludges, dead animals, pallets, batteries, antifreeze, asbestos, kitchen grease, pesticide containers, pollution control residuals, and septic tank wastes.

13. **SOLID WASTE MANAGEMENT FACILITIES**. The ISWMP should include descriptions of any solid waste management facilities used by the installation. Provide the types of information listed below. Include a map of the installation showing the locations of the facilities.

DISPOSAL FACILITIES

After planning for optimal source reduction and recycling on the installation, the ISWMP must address disposal of what remains of the waste stream. The installation's options are often determined by the existing facilities available for their use. These may be regional, local, or on-post facilities, and may include landfills, incinerators, or waste-to-energy plants.

a. On-Post Solid Waste Landfills (Sanitary Landfills).

(1) Landfill Description. Describe the landfill to include the size in acres, slope of the site, basic type (trench or area), and soil and ground-water conditions.

(2) Landfill Location. Include a map showing the location of the landfill. Reference the grid coordinates, road intersections, or other identifying information.

(3) Permit Status. Describe type of Landfill Permit, permit number, administering agency, expiration date. Attach a copy of the landfill permit and operational standards.

(4) Current Disposal Rate and Capacity. Indicate number of tons received each month, number of cells or trenches (full and remaining), and projected life expectancy.

(5) 10- and 20-Year Disposal Rates. Project future disposal rates using both the present disposal rate and future disposal rate (allowing for increased recycling and waste stream reduction). Compare the difference in the landfill life expectancy based on current versus proposed lower disposal rates.

(6) Types of Wastes Accepted/Excluded. List the waste types that are accepted and excluded from the landfill. For example, hazardous wastes and bulk liquid wastes (greater than household quantities) must be excluded from the landfill except where permit specifications allow them. Many states also have restrictions or bans on landfilling certain types of waste.

(7) Landfill Operation and Environmental Controls. Solid waste landfills must meet the operating criteria specified in 40 CFR 258, Subpart C. Describe the landfill operation by indicating how the installation complies with the following requirements. Include a copy of the landfill SOP as an appendix.

(a) Excluding the Receipt of Hazardous Wastes. Describe the procedures for random inspections, recordkeeping, and training of landfill personnel to recognize potential hazardous wastes.

(b) Cover Material. Describe the daily cover procedure. The current standard is 6 inches of earthen cover at the end of each working day.

(c) Disease Vector Control. Indicate the methods for controlling insects and animals at the landfill.

(d) Explosive Gases Control. Indicate if there is any gas venting or monitoring systems in place.

(e) Air Release Control. Indicate if any open burning is conducted and describe the permitting procedure associated with this activity. Open burning at solid waste landfills is severely restricted. Federal regulations (40 CFR 258.24(b)) allow burning of land clearing debris. State restrictions must be followed where applicable.

(f) Access Control. Indicate how the installation controls public access to the site (fencing, manned guard house, etc.). Restricted access is required to prevent illegal dumping and other unauthorized activities.

(g) Run-on/Run-off Control. Describe the run-on/run-off control structures at the landfill. A system must be in place to restrict water from entering the active portion of the landfill and control water running off the active portion of the landfill.

(h) Recordkeeping Requirements. Describe the recordkeeping that is performed relative to management of the landfill. Requirements specified in 40 CFR 258.29 must be met.

(i) Utilities. Indicate whether the site is serviced with water, electric, rest rooms, etc.

(j) Ground-Water Monitoring and Corrective Action. Describe the ground-water sampling and analysis program, statistical analysis of results, and the detection/assessment monitoring plan as required by 40 CFR 258. Summarize the results of past monitoring and any corrective actions that have been taken.

(8) Closure/Post Closure. Indicate whether the installation has a landfill closure and post closure care plan that addresses final cover, operation of leachate collection system, and ground-water/methane monitoring. Include a copy of the plan as an appendix if it exists.

(9) New Landfills and Lateral Expansions. If new landfills or lateral expansions are approved, briefly describe the plans and indicate conformance with the design criteria in the Federal regulations (40 CFR 258, Subpart D). (NOTE: AR 420-49 states that new landfills or landfill expansions on Army installations will not be programmed where municipal or regional systems are available until all alternatives are explored.)

(10) Percentage of Waste Stream. Determine the percentage of the installation's waste stream currently being disposed of in the on-post sanitary landfill.

b. Municipal/County/Regional Landfills. For all municipal/county/regional landfills, provide the following information (available from the state or county solid waste agency, or the landfill owner). This information should be provided for any nearby landfill that is used by the installation or may be used as a contingency or future disposal site. Refer to Section 12a for further explanations of the following subheadings.

(1) Landfill Description.

(2) Landfill Location.

(3) Permit Status.

(4) Disposal Rate, Capacity, and Life Expectancy.

(5) Types of Wastes Accepted/Excluded.

(6) Landfill Operation.

(7) Environmental Controls.

(8) Percentage of Waste Stream.

c. C&D Debris Landfills. Although requirements for construction debris landfills vary with each state, Federal regulations (40 CFR 257) contain general requirements. The following elements should be addressed in the ISWMP for on- or off-post construction debris landfills. Refer to Section 12a for further explanations of the following subheadings.

(1) Landfill Description.

(2) Landfill Location.

(3) Permit Status.

(4) Current Disposal Rate and Capacity.

(5) 10- and 20-year Disposal Rates and Capacities.

(6) Types of Wastes Accepted/Excluded.

(7) Landfill Operation.

(8) Environmental Controls.

(9) Percentage of Waste Stream.

d. Incinerators/Waste-To-Energy Plants. This category includes incinerators and waste conversion plants, and falls under the EPA definition of volume reduction processes. The DOD considers these to be disposal facilities, and wastes processed are not considered diverted from the waste stream. However, some states provide a fixed-percentage credit towards reduction goals when waste conversion is used in lieu of landfill disposal. Provide the following information (available from the plant or the state/county solid waste agency). Refer to Section 12a for further explanations of the following subheadings.

(1) Facility Description.

(2) Facility Location.

(3) Permit Status.

(4) Processing Rate and Capacity.

(5) Waste Types Accepted/Excluded.

(6) Facility Operation.

(7) Environmental Controls.

(8) Percentage of Waste Stream.

e. Transfer Stations. Transfer stations are centralized facilities for unloading wastes from several small collection vehicles and densely loading into larger vehicles for hauling to more distant processing, volume reduction, or disposal facilities. If a transfer station is used by the

installation (either on-post or off-post), provide the following information in the ISWMP. Refer to Section 12a for further explanations of the subheadings.

(1) Facility Description.

(2) Facility Location.

(3) Permit Status.

(4) Existing Storage Capacity.

(5) Projected Storage Capacity.

(6) Facility Operation.

(7) Environmental Controls (i.e., litter, runoff).

(8) Segregation and Storage of Recyclables.

(9) Percentage of Waste Stream.

f. Recycling Facilities. On-post recycling facilities are described in Section 9. In this section, provide information about off-post recycling facilities used by the installation to include:

(1) Facility Description.

(2) Facility Location.

(3) Permit Status.

(4) Processing Rate and Capacity.

(5) Recyclable Materials Accepted/Excluded.

(6) Facility Operation.

(7) Percentage of Waste Stream.

14. PROGRAM PROMOTION AND TRAINING.

PROMOTING THE PROGRAM

All aspects of the solid waste management program require some education and/or promotion. Rather than address promotion in numerous places through the ISWMP, it can be addressed in a single section as a separate management function. Education and publicity are essential elements of a successful solid waste program. Promotion is particularly important in the areas of waste reduction, recycling, composting, and G Procurement; therefore, promotion of each of these areas should be addressed to identify how these will be promoted and by whom. The ISWMP should detail all of the ways that information and advertisements can reach employees and on-post residents.

a. Promotional Tools. List all of the tools that will be used to promote various aspects of the solid waste program. Some examples are: fliers, posters, fact sheets, electronic mail bulletin boards and messages, articles in newspapers and magazines, marquee advertisements, closed circuit television advertisements, school visits, promotional events (e.g., participation in Earth Day and America Recycles Day), and new employee and new resident orientation programs.

b. Public Awareness. Discuss ways that the installation will heighten public awareness of their solid waste programs. Assign responsibilities for outreach programs to the appropriate personnel or activities. Some examples follow.

WHY PUBLIC AWARENESS?

Public education is an integral part of a solid waste management program, particularly a recycling program. On most Army installations, the public has daily interactions with the soldiers and civilians who work there. Waste-generating operations directly affect both the workers and surrounding communities. Legislation such as the Emergency Planning and Community Right to Know Act has reinforced the need to keep our neighbors informed of our activities, and has heightened the general awareness of the public sector.

(1) Public Meetings. Document plans to attend and/or hold public meetings on solid waste management issues as they relate to health, safety, or other environmental concerns at the facility or in the surrounding community.

(2) Community Events. Describe the installation's involvement in community-sponsored events such as Earth Day celebrations, America Recycles Day, and pollution prevention fairs.

(3) Media Information. Identify potential sources for news releases. Sources may include installation or local newspapers, closed circuit or local television stations, and/or magazines. (NOTE: Events such as elimination of a waste stream, attainment of waste

reduction goals, recycling initiatives, or positive progress in the recycling program are examples of newsworthy items.)

(4) Schools Outreach Programs. Identify current programs and potential opportunities to participate in functions at local schools, such as science fairs, school presentations, poster coloring contests, recycling drives, and mentoring programs.

c. Promotional Strategies by Program Area. This section should identify the activities or individuals that are responsible for promoting each of the following program areas: source reduction, Green Procurement, recycling, and composting. Also, for each program area, identify other offices that will assist and support the dissemination of information and advertisements. Detail promotional methods specific to each program area. Examples of specific methods for different program areas are: using building points of contact (monitors) to disseminate recycling instructions, advertising free compost mulch to on-post residents, including Green Procurement as a topic in the credit card purchasing training, and providing a list of consumer source reduction measures to housing occupants.

d. Training. Proper and relevant training is integral to the success and safety of solid waste management operations and recycling programs. Training programs may be in the form of formal training courses, correspondence courses, hands-on applications, or attendance at seminars and conferences. The ISWMP should:

(1) Identify jobs in solid waste management that require job-specific training. Describe how training is accomplished and tracked.

(2) Document current or planned training events or programs associated with solid waste management.

(3) Describe aspects of solid waste management that are addressed in new employee and new resident orientation programs.

(4) Provide suggested training sources that may be beneficial to installation solid waste management personnel. Some examples follow.

(a) Recycling. Training the recycling manager keeps him/her informed of new technologies and opportunities to recycle or otherwise reduce wastes. A recommended source is the National Recycling Coalition annual conference. The Army Logistics Management College (ALMC) offers a Qualified Recycling Program Course for recycling managers found at http://www.almc.army.mil/. Also, the Civil Engineer and Services School offers the "Qualified Recycling Program Management Course" found at http://www.afit.edu/cess.

(b) Green Procurement. Training on this subject is designed for environmental staff, procurement and logistics personnel, government credit card holders, and contracting officers. USACHPPM [(410) 436-2024] has developed onsite green procurement training available to all installations and facilities. The Defense Logistics Agency and the Office of the Federal Environmental Executive also offer training. Information on these classes is on the following

web sites: http://chppm-www.apgea.army.mil/gwswp/greenpro.aspx, http://www.hr.dla.mil/resources/training/disciplines.html, and http://www.ofee.gov/gp/training.asp.

(c) Solid Waste/Pollution Prevention. Solid waste management alternatives, new technologies, and P2 initiatives are rapidly changing areas. Recommended sources are the Solid Waste Association of North America annual conference (WASTECON), the Joint Services Environmental Management Conference, and the Installation Management Institute annual training conference. Conference information is available through the Defense Environmental Network Information and Exchange (DENIX) web site at https://www.denix.osd.mil.

(d) New Employee Training. Training programs for new employees may include sections on source reduction, recycling, Green Procurement, and overall environmental awareness. The ALMC offers basic environmental training courses http://www.almc.army.mil.

(e) Specific Job Training. Specific training and/or certification may be required for certain job descriptions, such as asbestos work, solid waste handling, operation of machinery (such as balers or crushers), and transportation of wastes.

15. **RECORDKEEPING AND REPORTING**.

a. Solid Waste Annual Reporting Web-Based (SWARWeb) System. The Solid Waste Annual Reporting Web-based system, or SWARWeb, is a DOD system to track and report installation solid waste and recycling data. The system also compares data with DOD metrics and provides trend analysis capabilities. SWARWeb is access through DENIX at https://www.denix.osd.mil.

(1) Identify the person(s) responsible for completing and reporting SWARWeb information. Ensure proper training is received for person(s) responsible for tracking/inputting SWARWeb information.

(2) Identify the installation elements (DPW, MWR, contractors, etc.) that need to provide input so that all installation-generated wastes, waste diversion, and recycling quantities are captured and submitted into the SWARWeb database.

(3) Use data from SWARWeb in developing section 7 of the ISWMP.

b. C&D Resource Recovery. Describe any recordkeeping and reporting mechanisms used internally by the installation. Indicate if recordkeeping and reporting requirements established by Army policy are being met. Section 1.7 (Records) of the UFGS 017419 specifies the information that must be documented regarding waste generation, diversion, and disposal and how the records must be maintained and submitted. Requirements for reporting C&D waste management data are detailed in section 1.8 (Reports) of UFGS 017419. For Army projects, quarterly and final reports must be submitted to the SWARWeb coordinator. All reports shall include project name; information for waste generated this quarter and cumulative totals for the project; supporting documentation to include manifests, weight tickets, receipts, and invoices

specifically identifying the project and waste material; and timber harvest and demolition information, if any. Section 3.8 (Non-Hazardous Solid Waste Diversion Report) of the UFGS 015720 requires that an inventory of non-hazardous solid waste diversion and disposal of C&D debris be maintained and reported quarterly to the Contracting Officer.

c. Green Procurement. List policies, procedures, and person(s) responsible for monitoring, tracking, documenting and reporting Green Procurement statistics. Such statistics may include total dollars spent on CPG items and percentage containing required recycled content, credit card expenditures meeting Green Procurement guidelines, and purchases exempt or otherwise unable to meet requirements. See the Army Green Procurement Guide at https://webportal.saalt.army.mil/saal-zp/acqinfo.htm for recommended recordkeeping procedures and sample forms.

d. Refuse Collection and Recycling. Identify procedures and person(s) responsible for completing the following reports, required by AR 420-49. These may be in-house or contracted responsibilities.

(1) SWARWeb. This is the required reporting system for solid waste management data.

(2) DA Form 3916 (Daily Log of Truck Trips for Refuse Collection and Disposal). Entries recording refuse weight (tons) will be made daily by collection truck drivers. All entries will be totaled monthly on DA Form 3917 (Refuse Collection and Disposal) by collection supervisors.

(3) DA Form 3917 (Refuse Collection and Disposal). Quantities of refuse collected and disposed will be reported in units of weight (tons) (see TM 5-634).

(4) DA Form 2788-R (Technical Data Feeder Report). The data from DA Form 3917 will be used to prepare parts of DA Form 2788-R. The DA Form 2788-R will show the quantity of refuse collected and disposed, the quantity of material recycled, and the proceeds from sales.

16. **FACTORS AFFECTING SOLID WASTE MANAGEMENT DECISION-MAKING**. List the installation-specific factors that have affected or could affect solid waste management decision-making. Examples of some factors or considerations follow:

a. Limitations of Current Disposal Capacities. Summarize the potential for on-post/local/regional landfills to close or further restrict the acceptance of installation-generated wastes. Indicate whether other disposal facilities (incinerators, conversion plants) are expected to cease operation or restrict acceptance of installation-generated wastes.

b. Potential for Future Facilities. Include projections for the construction of new waste management, recycling, or composting facilities (cooperative or regional facilities, for example).

c. Mission. The installation's mission affects the types and quantities of wastes and recyclables generated. Mission changes or base closure/realignment should be considered in the development of the ISWMP.

d. Size and Population. The size and population of the installation are directly related to the amount of solid waste and recyclables generated. Projected changes in the size or population should be noted in the ISWMP to include the impact of the changes on all aspects of solid waste and recyclables management. Identify plans for changes in Major Command, garrison reorganization, or relocation of tenant activities since these can affect the workforce or residential population.

e. Recyclable Commodities Markets. Another important factor is the strength of recyclable markets, which may vary considerably and may determine whether an item is recycled. Details on recycling markets should be included in Section 9.

f. Community Relations. Describe any relevant public opinions or political pressures that may affect the installation's management of solid waste and recyclables.

g. Environmental Setting. Installations that are located in environmentally sensitive areas may encounter additional restrictions on the management of wastes. These additional restrictions should be discussed in the ISWMP to justify associated decision-making.

h. Regulatory Requirements. State and local regulations play an important role in solid waste management planning. The ISWMP must identify and reference all applicable state and local regulations. It may be useful to identify state or local requirements that are more stringent than the Federal standards or are believed to be unique to that locale.

i. Cost. A long-term comparative cost analysis should be included in the ISWMP for all feasible waste management options. Some factors to be considered are:

(1) Long-term (life cycle) costs associated with on-post landfills such as routine operations, maintenance, equipment, ground-water and methane monitoring, permit renewals, site expansions, reporting and recordkeeping, closure, post-closure care, potential corrective actions, and future liabilities.

(2) Off-post disposal costs, such as tipping fees, collection and transport, vehicle maintenance (if performed with in-house resources), reporting and recordkeeping, and the need for alternative disposal methods for wastes excluded at the disposal site.

(3) Cost avoidance, such as the reduced costs of waste collection and disposal associated with starting or expanding a recycling program.

j. Legal Factors. Issues such as liability and future property ownership and land use may also come into play during solid waste management decision-making. Possible legal hindrances to various solid waste management options should be identified in the ISWMP.

17. **CONTINGENCY PLANNING**. List information necessary in the event that current management or disposal options fail, such as:

a. List all disposal/transfer facilities within a 50-mile range of the installation.

b. Provide an up-to-date list of POC's at commercial waste hauling or disposal facilities.

c. List Federal (EPA), state and local solid waste management office and contacts.

d. List POC's at other military installations within reasonable distance of the installation, particularly those operating onsite landfills. (Note: it is Army policy that installation-operated landfills not accept wastes from outside sources. This is provided for emergency/contingency planning only).

WHAT IF…?

The ISWMP should evaluate the adequacy of current disposal mechanisms and contain provisions for alternate disposal mechanisms in the event that the present facilities fail to meet disposal needs. It is recommended that prior arrangements or agreements be made with regional or local disposal facilities to confirm that a backup option exists. Participation in local planning boards may further secure the installation's interests in disposal contingency planning.

18. **SOLID WASTE MANAGEMENT ACTION ITEMS**. List suggested actions in order of priority to achieve the solid waste management goals and objectives. The following are examples of action items:

a. (example) Address implementation of this ISWMP at EQCC meetings or other installation forums. Use these meetings and/or EMS functional team meetings as forums to discuss issues regarding solid waste management, recycling, or green procurement.

b. (example) Develop procedures to educate all purchasing activities, including government credit card holders, in environmentally preferable buying practices.

c. (example) Set up a waste exchange, by electronic bulletin board, newsletter, or other method. Activities generating potentially reusable items will advertise the excess materials so they may be reused by another activity.

d. (example) Enhance public education on waste management and recycling issues through public meetings, community events, school programs, and use of the media.

e. (example) Report solid waste management data using SWARWeb. Include computation of the waste diversion rate resulting from implementation of the QRP.

f. (example) Include provisions for the reuse or recycle of excess or waste materials associated with construction and demolition projects.

g. (example) Initiate a low-technology compost operation for the management of yard wastes. Account for all diversion of wastes due to this operation.

h. (example) Periodically review this plan and the solid waste management program to evaluate their effectiveness and relevance.

19. **PERIODIC EVALUATIONS AND UPDATES**. Specify that the ISWMP will be reevaluated periodically or under certain conditions and updated as needed. Examples of conditions that would warrant reevaluation of the plan are: regulatory changes, changes in the types or quantities of wastes generated, reductions in the waste stream due to successful minimization/recycling programs, changes in the availability of regional disposal facilities, and new or amended contracts that affect solid waste management.

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